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METEOROLOGICAL DEPARTMENT

INDIA WEATHER REVIEW, 1954

ANNUAL SUMMARY

PART B

SNOWFALL

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INDIA WEATHER REVIEW, 1954

ANNUAL SUMMARY

PART B

SNOWFALL

This part contains a summary of the reports of snowfall in the mountain regions to the north of India based on (a) records of snowfall observations made at observatories and (b) reports collected by local officers from the local residents, headmen of villages or from travellers who have passed through the region and are then transmitted to this office.

The amount of snowfall is usually measured by finding the depth of undisturbed snow lying on the ground. The measurements are given in feet and inches. At places provided with raingauges the snow collected in the gauge is melted and measured as rain. This is indicated in the text and the measurements are given in inches and cents.

Cold Weather Period—January and February

I—JAMMU AND KASHMIR

Dras.—There were heavy falls of snow on 10 days in January and on 13 days in February, the total depths being 10′ and 3′6″ respectively at the station and more than 4′ on high peaks in February. Snow accumulation at the end of each of the months was 10′ and 6′ at the station and 13′ and 7′ respectively on the peaks. Both the falls during and accumulation at the end of the period were above normal.

Srinagar.—Light to moderate falls of snow were observed on the surrounding mountain range Pir Panjal and in the valley almost throughout the period under report. The heaviest fall of 1·3″ in January was recorded on the 19th and that of 1·23″ in February on the 2nd. The total precipitation recorded at the central observatory, Srinagar, amounted to 4·6″ in January and 5·97″ in February, being above normal by 1·26″ and 3·13″ respectively. Snowfall during the accumulation at the end of the period were above normal.

Kargil.—Snowfall with depth varying from ½″ to 8″ was observed in the locality on 10 days in January and on 11 days in February. The total depths of the falls were 2′ ½″ in January and 2′ 6½″ in February which were also reported to be the accumulations at the end of the respective months. The falls were above normal.

Sonemarg.—Snow fell at the station as well as on the surrounding Zojilla and Nichnay passes on 9 days in January and on 10 days in February. The depth of the individual falls varied up to 3′ with a total depth 4′ 10″ in January and 7′ in February. Snow accumulation at the station was 8′ at the end of January and 9½′ at the end of February. The falls were normal during the period.

Leh.—January and February each had 10 days of snowfall both at the station and on the passes. The depth of the falls at the station varied up to ½″ in January and 4″ in February. The snowline descended to 10,500′ in January and 11,500′ in February while accumulation at the end of the period ranged from 1′ at a height of 13,000′ to 10′ at 18,000′. Both snowfall and accumulation were below normal in January and above normal in February.

II—THE PUNJAB (I)

Chamba District:—

Chamba (Kalatope).—Snowfall of depths varying from 0·8″ to 10″ occurred on 14 days in January and on 15 days in February. The total depth of snow at the station and on Basodhan Pass (9,000′) was 6′ 7″ and 7′ respectively in January and 7′ 11″ and 9′ in February. The lowest height to which snowline descended in January and February was 3000′ and 4000′ respectively. Snow accumulation at the end of the respective months on the passes was as under:—

Name of the pass	Height a.s.l.	Accumulation in ft.	
		January	February
Sach	14,500	40	45
Padhri	12,000	25	25
Basodhan	9,000	14	15

The falls during the period were above the average of previous years.

Lower Chamba.—There were 5 occasions of snowfall in January and 2 in February, the total depths being 2' 11" and 1' 33" respectively at Khajiar Lake. The snowline descended to 3000' in January. Snowfall was said to be normal in January and slightly above it in February.

Tissa.—Snow storms occurred on 7 occasions in January and on 2 days in February, the heaviest falls recorded being 10" and 7" respectively. The snowline descended to 5000' during the period and accumulation at Sach Pass was 20' and 15' at the end of January and February respectively. Snowfall was above normal in January and below normal in February.

Tikri (Chhatri).—Snow fell at the station and on the higher passes on 4 occasions in each of the months January and February and the total snowfall was 6' and 2' respectively at the station. The snowline descended to 3500' in January and 4500' in February. The amounts of snow accumulation at the end of each month were as given below:—

Locality	Accumulation in feet	
	January	February
Station	4	2
Higher pass (Drati)	23	20

Snowfall was above normal during the period.

Bhandal.—There were 8 snowfalls in January and 3 in February at the station. The depth of the falls varied from 5" to 11" in January and 3" to 8" in February, the total depths being 6' 6" and 1' 3" respectively which were also reported to be the accumulations at the end of the respective months. The higher passes were covered with snow. Snowfall was above the average of the previous years.

Bhattiyat.—There were 2 snowfalls in January and the depth was 4' in Gharam area. Accumulation at the end of the month was 4' to 6' at Kharadunda Jote. Snowfall during the month was above normal. No report for February was received.

Pangi.—Snow fell on 11 days in January and 20 days in February to the total depth of 5' 4" and 11' 4" respectively. Snow accumulation at Kilar (8400') was above 11' at the end of the period and the fall was above the average.

Mahasu District:—

Rajgarh.—January witnessed snowfall on 4 days the depth of snow being 3½' to 4' on the higher altitudes and 1½' at the lower level. The snowline descended to 6000 in this month and the accumulation at the end was 2' to 5' at Chur and 6" to 1' at Habbir range. Snowfall was said to be more than usual. Report for February was not received.

Haripur.—January had 2 snowfalls and February 3 with the depth of snow varying from 4' to 5' at Haripur peak and 5' to 6' at Churdhar peak. These figures were also reported to have indicated the amounts of accumulation at the end of the months. Snowfall was above normal.

Kasumpti.—6 light to moderate falls of snow together with the heaviest fall of 7" were observed at the station in January. The total depth of falls was 1' 2" during the month but accumulation was only 2" at the end. Snowfall was normal for this month. No report was received for February.

Suni.—In January, snow had fallen on 6 occasions in Seraj area and on 5 occasions in Chantha area, the total depth of falls being 2' at the former and 1' at the latter. Snow accumulation was 3' at the end of the month but it was melting away soon with the rainfall. Snow was less than in the last year.

Shilaroo.—5 moderate to heavy falls of snow with depth varying from 2" to 21" were observed in each of the months January and February. The total depth of falls at the station was 3' 11" in January and 3' 4" in February and the snowline descended to 7000' in both the months.

Rampur.—There were 5 snow storms in January and 8 in February with the snow descending to 4000' during the period. Accumulation on the high peaks was 4' at the end of January and 6' to 7' at the end of February.

Chini (Kalpa).—Light to moderate or heavy falls were observed on 12 days in January and on 14 days in February the total depths as measured at the raingauge station being 5' 10¾" and 4' 11" respectively. Accumulations at the end of the months were about 7¾' and 12¾' which were more than in the last year. Snowfall during and accumulation at the end of the period were above normal.

Chopal.—Snowfall of depth varying from 3" to 1' 8" at various places occurred on 7 days in January and on 6 days in February. The total depth of falls at Chopal proper was 4' 5" and 4' 1" respectively in January and February. The accumulation of snow at the station was 1½' at the end of January and 1' at the end of February while it was 4' and 4½' respectively on the passes. Snowfall was about normal.

Pandrabis.—There were 8 falls of snow in January and 11 in February. The depth of the individual falls varied from 2" to 2' 9" and the total depth was 4' in January and 7' 9" in February. The snowline descended also on the well-known Shrikhand Pass (about 14,000'). Snow accumulation at the end of January and February was 5½' and 18' to 20' respectively on the higher passes. Snowfall during the period was above average.

Kilba-Kailash.—Snowfall with depth varying from 1' to 5' 5½" was observed at Kilba, Sangla and Purbani both in January and February. The snowline descended to the level of the river Sutlej (5,500') during the period. The accumulation of snow at the end of the period was 4' 6", 12' 11" and 12' 1¼" respectively at Kilba, Sangla and Purbani and 16' on the Rupan, Busan and Sathul passes. Snowfall was normal for the period.

Taranda (Nichar Raingauge station).—Report for January only was received. Accumulation of snow was 5' 4" at an elevation of 8,000' and was estimated to be 12' to 18' at 9,200' to 11,000'. Snowfall was about normal.

Kumarsain.—Snowfall occurred on 3 occasions in January and on 2 occasions in February. The depth of the falls varied from ½" at the station proper (5000') to 4' on the Hatu, Narkanda and other high peaks of height up to 11,000'.

Kotkhai.—Snow fell to a depth of 9″ at the station and about 10′ on the high peaks in January while no snowfall occurred in February. Snowfall was normal for the month.

Theog.—January witnessed 8 falls and February 6 with the snowline descending to 5000′. Accumulation at the end of the months was as given below :

	Accumulation in feet.	
	January	February
Theog proper	3½	1
Phagu	3	2

Snowfall was above the average of previous years.

Jubbal Tehsil.—January received snowfall on 9 days and February on 11 days. The depth of the falls varied from 2″ to 3′ at the station proper and from 4″ to 6½′ at Kupar, the highest peak in the Tehsil. The snowline descended to a height of 4000′. Snowfall was above normal.

Kangra District.—Frequent and heavy snowfalls occurred on the peaks and mountains of this district both in January and February. The snowline descended to a lower level than usual and the season was cold. Snowfall during and accumulation at the end of the month were as given below :

Tehsil	Peaks	Depth in feet		Accumulation in feet	
		January	February	January	February
Kulu	Hamta .	25	14	19	28
	Rohtang .	24	13	18	26
	Chandarkhani	13	5	9	11
Seraj .	Sirikhand .	8	10	10	18
	Bashleo .	½	9	7	14
	Jalori . .	6½	5	6	10

Snowfall was above average.

Mandi District.—Snowfall occurred on 9 days in January and 7 days in February. The amounts of fall at the different passes were as given below :

Passes	January	February
Samehni	3′ 2″	5′ 4″
Galtu	2′ 0″	2′ 2″
Magru	2′ 7″	...
Prasar Dhar	7′ 6″	13′ 0″

Snowfall was said to be below average.

III.—UTTAR PRADESH

Garhwal.—There were 17 falls of snow in January and 23 in February. The depth of the falls varied from 1′ to 4′ in January and 1″ to 5″ in February. Accumulation at the end of the period was about 3″ on the peaks. Snowfall was below the average of previous years in January and above average in February.

Tehri Garhwal.—There were four snowfalls in January and the accumulation at the end of the month varied from 4″ to 2′. February received 3 wide-spread falls and some others confined to high peaks only. The snow descended to 4,000′ and its depth varied from 2″ to1′ by the month end. Snowfall was below normal in January and above it in February.

Almora.—The following table gives the amount of falls during and accumulation at the end of January and February.

Locality	Total amount of falls in ft.	
	January	February
Malla Danpur	12–14	11–14
Malla Darma	10	5
Malla Johar	15	15–21
Chaudans	8	6
Byans	5–7	8–12
	Accumulation in ft. at the end of	
	January	February
Kotila Hill	8	8
Kotila Valley	30	29
Kafini Hill	35–40	32–37
Kafini Valley	30–35	25–30
Bankatia Hill	35–40	30–35
Pinder Valley	80	75
Pinder Peak	45–50	45–50
Nanda Khat	50–55	45–55
Sunderdhunga Valley	25–30	25–30
Sunderdhunga Hill	20–25	20–25
Lipia	9	8
Lipu	6	6
Nebudhara	15	12

Snowfall was above the average of previous years.

Mukteswar (Kumaun) observatory.—5 snowfalls with depths varying from 2½″ to 7″ were recorded in January and 2 falls each of depth 4″ in February. Total depth of the falls was 1′ 10″ in January and 8″ in February. Snowfall was moderate during the period.

IV.—ASSAM

Kamrup.—There was no snowfall in Barpeta subdivision of the district during the period.

Siang Frontier Division (Mechukha).—There were 2 falls in January, the total depth being 1′ 9″ for the month. The depth was reported to be 5′ to 8′ on the higher passes. Report for Feburary was not received.

Hot Weather Period—March to May.

I.—JAMMU AND KASHMIR

Dras.—Snowfall was observed at the station and on the mountains on 10 days in March, 6 days in April and on 2 days in May. The depth of the individual falls at the station varied from 1″ to 11″ in March, 2″ to 3″ in May and did not exceed 1″ in April. The total depth of falls during and accumulation at the end of the months were as given below :

	March		April		May	
	Falls	Accumulation	Falls	Accumulation	Falls	Accumulation
Station . .	2′ 2″	4′	6″	6″	5″	...
Mountain .	...	6′	...	1′	9″	1′

Snowfall was above the average.

Srinagar.—There was no snowfall in April while no report was available for March. In May, a few light falls were observed on the surrounding mountains during the first half of the month. At the end of the period snow accumulated during the winter was existing on the mountains. Snowfall in May was reported to be above normal.

Kargil.—Report for March only was received. In this month snowfall with depth of the individual falls varying from ½″ to 3″ was observed on 4 days. The total depth of all the falls was 5″.

Sonemarg.—Snowfall occurred at the station and descended to the Zojilla and Nichnay passes on 2 days in March and once in May while no fall was reported in April. The depth of falls varied from 3″ to 1½′ in March and was 6″ in May. Snow accumulation at the end of March and April was 6′ and 2′ respectively at the station while at the end of the period it was nil at the station and 6′ on the Zojilla peak. Snowfall was normal during the period.

Leh.—The report for April is not available. Snowfall occurred at the station and on the higher passes on 7 days in March and on 4 days in May. The falls were generally light in character. Snow accumulation at the end of March and May varied from 1′ to 3′ and 3′ to 5′ respectively on the southern slopes and 3′ to 10′ on the northern slopes. The snowline descended to 10,500′ and the fall was about average during the period. Snow accumulation at the end of the period was above normal.

II.—THE PUNJAB (I)

Chamba District:—

Chamba—(Kalatope).—Snowfall occurred on 5 days in March and 1 day in May while no snow fell in April. The depth of the falls was 1′ 1″ at the station and varied from 1′ to 5′ on the passes in March. In April this depth was 6″ on the passes. Snow accumulation at the end of May was 1′ to 5′ on the passes. Snowfall was normal in March but above normal during the period and the Snow-line descended to 7000′ a.s. l.

Pangi.—There was snowfall on 8 days in March, 1 day in April and on 2 days in May. The depth on individual days varied from 1″ to 9″ in March, 1″ to 2″ in April and May, the total depth being 2′ 2″, 1″ and 4″ respectively.

Trehta.—Report for May only was received and it indicates that there were 4 falls in the month, each fall contributing 1′ towards accumulation on the passes. Snowfall was above the average.

Bharmaur.—Only the report for May was received. It is reported that there were 6 days of snowfall in May with 1′ of snow each day on the passes. The falls were above normal.

Mahasu District:—

Kilba Kailash.—Snow fell to a depth of 1″ to 3¼″ at the station and to 2′ on the passes in March. April had falls on 6 days the depth on the passes being 6″ only. Snow accumulation at the end of March and April was 18′ and 12′ respectively on the passes. There was no fall in May. The falls were normal in March and below normal in April.

Chopal.—Snowfall occurred in March and April while no report for May was received. Accumulation on the passes was 2′ and 1′ at the end of March and April respectively.

Rampur.—Snowfall occurred on 3 days in March and the accumulation on the higher passes was 4′ to 5′ at the end of the month. There was no snowfall in April while report for May was not received.

Kangra District.—The following table gives the amount of snowfall on peaks during and accumulation at the end of March and April. In May there was no snowfall.

Name of Peak	Amount of falls in ft. during		Accumulation in ft. at the end of	
	March	April	March	April
Hampta . . .	7	10	23	17
Rohtang . . .	7	12	22	10
Chandarkhani . .	3	8	13	5
Sirikhand	6	6	19	8
Bashleo	4	5	10	5
Jalori	1	5	7	2

Snowfall was normal in these months.

Mandi District.—There occurred 3 snowfalls in March and none in April and May. In March the depth of the falls on the highest peak Shikari was 8′ and the snowline descended to 5,000′. Snow accumulation on the high peaks was heavier as compared to last year's.

III.—UTTAR PRADESH

Garhwal.—March witnessed no snowfall while April and May had 8 falls each. The depth of the falls on the high peaks was 6′ to 8′ which was also reported to be the accumulation at the end of the period. Snowfall was less in April and more in May than that in the corresponding months of the last year.

Tehri Garhwal.—Snowfall with depth varying from ½″ to 1″ occurred on 2 days on high peaks in March while no snow fell in April and May. The

snowline descended to 8,000′ and the accumulation at the end of March was ½″ to 1″ on the high peaks. The snowfall in the month was more than that in the last March.

Almora.—The estimated amounts of snowfall during and accumulation at the end of each month of the period were as given below:

Locality	Amount of falls in ft. during		
	March	April	May
Malla Danpur	9–11	2–3	...
Malla Darma	8	2½	1–1½
Malla Johar	9	1–3	2–3
Chaudans	6	...	...
Byans	8–10	5–8	...
	Accumulation in ft. at the end of		
	March	April	May
Kotila Hills	2	1½	½
Kotila Valley	2½	2	1½
Kafini Hill	10	6	1½
Kafini Valley	12	10	2
Bankatia Hill	14	12	8
Pinder Valley	25	12	4
Pinder Peak	30	10	2
Sunderdhunga Valley	18	9	4
Sunderdhunga Hill	20	7	3
Nanda Khat	24	20	15
Lipia	15	...	...
Lipu	20	...	...
Nebudhara	22	...	1½
Panch Chuli	...	...	1½

South West Monsoon Period—June to September

June and July

I.—JAMMU AND KASHMIR

Dras.—In June no snowfall was observed at the station, but on rainy days slight snow fell on the higher peaks. July also had no snowfall anywhere. Snow accumulation on the high peaks at the end of June and July was above normal and amounted to 1′ and 6″ respectively. Avalanche snow between Kaupathri and Machoi was above normal during the period and at the end of July was 10′ to 20′ deep.

Srinagar.—No snowfall occurred either at the station or on the surrounding mountains during the period. Snow of the last winter was existing on the tops and gorges of the mountains at the end of June.

Sonemarg.—No snowfall was observed during the period. Snow accumulation was nil on the ground and as usual on the peaks.

Gulmarg.—Two light snowfalls were observed on the surrounding Handibal and Affarwat mountain ranges during June and the snow melted away soon. The total precipitation of the months was 3:93″. Snowfall during and accumulation at the end of the month were abnormal on the mountains. The report for July was not received.

Leh.—No snow fell during the period but accumulation was comparatively heavier and snowline lower than usual.

II.—THE PUNJAB (I)

Chamba District:—

Chamba.—There was no snowfall during the period except for some sporadic hail showers on the higher elevations in July. At the end of the period some traces of snow only were noticed in depressions on the northern aspect. Otherwise the passes were entirely free of snow. Snow due to avalanches was existing at a height of 18,000′.

Churah.—June had received a few light falls of depth 2″ to 3″ on high peaks while July was almost without snowfall. Accumulation of snow at the end of the period was 1′ to 2′ in depressions.

Tikri.—No snow fell in June while 2 falls with depth 6″ to 10″ occurred in July. Accumulations on the well-known passes were as given below:

Passes	June ft	July ft
Drati	4–5	4–4½
Mahru	4½	3–4½

Pangi.—There was no snowfall in June while 8″ of snow fell on the peaks and passes in July. No accumulation was seen on the passes at the end of the month, but plenty of snow existed in nullahs and depressions.

Bharmaur and Trehta.—Five snowfalls with depth varying from 2″ to 4″ on the high peaks and ranges were observed in June while no snow fell in July. Accumulation of snow on the well-known higher passes was about 2′ at the end of July. Snowfall was said to be below the average of previous years.

Kangra District.—There was no snowfall below 19,000′ in the Kulu sub-division of the district. The snowline was at 15,000′ and the accumulation was normal.

Mandi District.—No snowfall was observed in the District.

III.—UTTAR PRADESH

Garhwal.—There occurred 8 snowfalls in June but none in July. The depth of the falls varied from 2″ to 6′. Snowfall was above normal in June.

Tehri Garhwal.—No snow fell during the period.

Almora.—There occurred no snowfall in the district during the period under report.

August and September

I.—JAMMU AND KASHMIR

Dras.—There occurred slight snowfall of ½″ on one day in August and 2 falls of 3″ to 1′ in September. Snow accumulation at the end of August and September was 5″ and 8″ respectively on the high peaks while no snow existed at the station.

Srinagar.—Snowfall occurred on 1 day in August and on 2 days in September on the surrounding mountains only. Accumulation at the end of the period was 1′ on the mountains. Snowfall was below normal in August and above normal in September.

Sonemarg.—No snowfall was noticed during the period except for 2 falls on the high peaks in September. Snow accumulation was nil at the station but as usual on the high peaks.

Leh.—Report for August was not received. There were 5 days of snowfall in different parts of the district in September. The snowline was at 13,500′ to 14,000′. At the end of the period only thin layers of snow were existing on the higher grounds.

II.—THE PUNJAB (I)

Pangi.—There occurred 1 snowfall of 2″ on the high peaks both in August and September. There was no accumulation of snow at the station while plenty of avalanche snow was existing in nullahs and depressions at the end of August and 3′ on Sach pass at the end of September. Snowfall was about average during the period.

Kilba Kailash.—Snow fell to a depth of ½″ on Rupan, Busan and Sathul passes at a height of 16,000′ in August. In September, several falls with depth varying from ½″ to 3″ on the passes were observed in this range. Snow accumulation at the end of the period was 8″ to 10″ on the passes and the fall was above normal.

Chini.—No snowfall was observed. Peaks over 17,000′ were covered with snow.

Kangra and Mandi Districts.—No snowfall was observed.

III.—UTTAR PRADESH

Garhwal.—There were 4 snowfalls in August and 9 in September. The depth of the individual falls varied from 1″ to 1½″ in August and ½″ to 1″ in September. Snowfall was below average in August and above average in September.

Tehri Garhwal.—No snowfall was observed.

Almora.—The estimated amounts of falls during and accumulations at the end of each month of the period are given below:

Locality	Falls	
	August	September
Malla Danpur	1½″–3″	3″–8″
Malla Dharma	...	1″–5″
Malla Johar	...	2′
Chaudans	1′	7′–10′
Byans	4′–6′	1/8′–1½′

Locality	Accumulation at the end of	
	August	September
Kotila Hill	...	3
Kafini Hill	...	4″
Bankatia Hill	2½″	7″
Pinder Peak	2″	7″
Nanda Khat	3″	8″
Sunderdhunga	1½″	5″
Nanda Devi Hill	3″	...
Lipu Lekh	4′	7½′
Lampia	6′	10¾′
Nabudhura	...	5″

Snowfall was above average.

IV.—ASSAM

Tawang.—There was no snowfall during August. Only one snowfall occurred in Sela, Bumla and Mago ranges. Snow accumulated to a depth of 1′ and the fall was normal in character.

Kamrup.—There was no snowfall during the period in Barpeta sub-division of the district.

Post-monsoon Period—October to December.

I.—JAMMU AND KASHMIR

Dras.—There were light snowfalls on 1 day in October, 3 days in November and on 5 occasions in December. The depths of the individual falls varied from ¼″ to ½″. Snow accumulation at the end of October was nil at the station and as usual on the peaks whereas at the end of November and December it was 8″ both at the station and on the peaks. Snowfall was normal in October and November and below it in December.

Srinagar.—Snowfall was observed on the surrounding mountains on 2 days each in October and November while in December a few light falls were noticed on the mountains and 2 in the main valley. Snow-accumulation on the mountains was very thin at the end of October, ½′ at the end of November and about 1′ at the end of December. Snowfall was normal in October and November and below it in December.

Kargil.—October had 1 snowfall on the surrounding mountains while November and December each had 2 falls on the mountains and 1 at the station proper. The depth of the falls varied from 1″ to 1½″ at the station and 6″ to 1½′ on the mountains, the total depth on the mountains being 6″ in October and 2½′ each in November and December. Accumulations of snow at the end of the months were 1½′, 4′ and 6½′ respectively. Snowfall was below average during the period.

Sonemarg.—Snow fell at the station and on the Zojilla and Nichnay passes on 1 day in October, 6 days in November and on 3 days in December. The depth of the falls was 3″ in October, varied from ½″ to 8″ in November and 3″ to 1′ 2″ in December. The total depth was 1′ 3½″ in November and 1′ 5″ in December. Snow accumulation in the plains was nil at the end of October and 12″ and 6″ at the end of November and December respectively while it was as usual on the high peaks. Snowfall was normal during the period.

Leh.—Light to moderate snowfall occurred at the station and on the high passes on 2 days in October, 6 days in November and on 10 days in December. The

snowline was at 13,000′ in October, 11,000′ in November and below 10,000′ in December. Snow accumulation at the end of October was 2″ to 5″ at a height of 16,000′ and 6″ to 2′ at 18,000′. No definite information regarding the accumulation in November and December was available as the passes were temporarily blocked due to heavy accumulation. Snowfall was normal in October and above it in November and December.

Patnitop (Batote).—There was no snowfall in October while it snowed at the station and on the ranges on 2 days in November and 5 days in December. At the end of the period very little snow was existing at the station. Snowfall was below average during the period.

II.—THE PUNJAB (I)

For most of the stations in this region reports for December only were received. Hence, unless otherwise stated, reports for October and November are to be considered as not available.

Chamba District—Upper Chamba.—There occurred no snowfall in October but only 1 fall of 3″ in November. December had 2 falls with depth of the individual falls varying from 2″ to 8″ at the station and 4″ to 3′ on the passes. The total depth was 10″ at Kundi, 4′ on Baliani pass and 1 5/6′ on Bohar pass. Snowfall was below normal.

Dalhousie.—Snow fell on 5 days to a total depth of 1′ 9½″ in December and the depth on individual days varied from ½″ to 6″. Accumulation at the end of the period ranged from 1½′ to 2′ on the passes and the fall was below normal.

Pangi.—There occurred snowfall on 2 days each in October and November and on 7 days in December. The depth on individual days varied from ¼″ to 5″ and the total depth from ¾″ to 10½″. Accumulation at the end of the period was 7′ on Sach pass. Snowfall was normal in October and below normal in November and December.

Bhandal.—December had 5 falls of total depth 1′ 5″ the individual falls varying from 2″ to 6″. Accumulation at the end of the month was 3′ on the passes and the snowline descended to 5000′. Snowfall was normal in the month but below normal during the season.

Tissa.—There occurred 1 snowfall of ¼″ at the station and 5 falls on the passes during December. Accumulation at the end of the period was 8′ to 10′ on the peaks and passes and the fall was below normal during the season.

Trehta.—There were 10 days of snowfall in December, the depth at the station amounting to 1′ 11″. Snowfall was above average and the snowline descended to 4000′.

Mahasu District—Nichar.—December had snowfall on 2 days at the station and 6 days on the passes, the depth being 2½″ at the former and 2′ on the latter. Accumulation at the end of the period was 2½′ to 3′ on the passes and the fall during the period was below normal.

Kilba-Kailash.—There were 6 falls in October and 13 in November on the passes. December had 7 days of snowfall at the station with the depth on individual days varying from ½″ to 2″ and the total depth up to 6″. Accumulation at the end of the period was 4′ on the passes and the fall during the period was rather below normal.

Lower Bushahr Division.—Snow fell on 5 days in December. The depth on individual days varied from ½″ to 6″ and the total depth was 12½″ at Khadrala and 5½″ at Bashla. The falls were below normal in this month.

Chini (Kalpa).—October had one fall and December 2 falls while November had none. The total depth was 2¼″ in December and the fall was below normal during the period.

Chopal.—There were 3 falls each of 2″ depth in December. The snowline descended to 5000′ and the fall was below normal.

Sirmur.—Snowfall occurred on 2 days in December and the accumulation at the end of the period was 4′ to 5′ at Chur Dhar and 6″ to 9″ on other peaks. Snowfall was above normal.

Kumarsain.—Snow fell at the station and on the passes on 1 day in December, the depth varying from 1½″ at the former to 9″—1′ at the latter. The snowline descended to 5000′ a.s.l.

Suni.—December had snowfall on 4 days to a total depth of 9″ at an elevation of 5000′ to 6000′. Accumulation on the well-known peak of Shali was 1½′ at the end of the month and the fall was below normal.

Shilaroo.—Snowfall occurred at the station from 27th to 28 and 29th to 30th December and the total depth was 7½″.

Rampur.—There were snowstorms on 3 days in December and the depth on high peaks and passes went up to 2½′. Accumulation at the end of the month was 1′ on Daranghati and Hatu peaks.

Pancha.—Snowfall varying from 1″ to 2″ in depth occurred on 3 days in December and the total depth was 4″. The snowline descended to 5,500′ and accumulation at the end of the month was 6′ on Shrikhand peak, the highest peak in the region. The fall was below normal.

Parala.—There were 2 light snowfalls at the station in December. The snowline descended to 5000′ and the fall was below normal.

Kangra.—No report was received for October and November. The depth of snowfall as received in December is given below for the various passes :

Tahsil	Pass	Depth in ft
Palampur	Amar	3
	Saugur	3
	Swar	3
Kulu Sub-division	Hamta	5
	Rohtang	4
	Bashleo	1½
	Jalori	1

The snowline descended to 6000′ and the snowfall was below average.

Mandi.—Snowfall with total depth varying from 2″ to 6″ occurred on the higher elevations in October and November. December had 5 days of snowfall of depth ½″ to 4″ with the snowline descending to 5000′ during the month. The depth of snow on the high peaks and passes were as follows:

Passes	Depth in ft.
Shikari Devi	2½
Rai Garh	2
Chait Galu	2
Tangasan Garh	1½
Bhubu	1
Tunga Devi	½

III.—UTTAR PRADESH

Garhwal.—There occurred 7 snowfalls in October, 8 in November and 12 in December, the depth of the falls varying from ½″ to 1″, ½″ to 2″ and 1″ to 4′ respectively during the months. The snow accumulated on high peaks of 11,000′ and above, was below normal in October and above it in November and December.

Tehri Garhwal.—No snow fell in October and November while 2 falls were observed in December. The depth of the falls varied from ½″ to 2″ on the high peaks and the snowline descended to 5000′. Snowfall was below average.

Almora.—The following table gives the estimated amounts of falls during and accumulation at the end of each month of the period under report.

Locality	Depths of falls in ft. during October	November	December
Malla Danpur	1–2½	...	2–8
Malla Johar	2–4	...	4–12
Malla Darma	·18	4	5
Byans	½–3½	3½–5½	8
Chaudans	1/8–1½	1	...
	Accumulation in ft. at the end of		
	October	**November**	**December**
Kotila Hill	1	...	2
Kafini Hill	1½	...	3
Bankatia Hill	2	...	4
Pinder Peak	2	...	4
Pinder Valley	...	...	8
Nanda Khat	2½	...	5
Sunderdhunga Peak	2	...	4
Sunderdhunga Valley	...	...	18
Naibudhura	18	4	5
Limpia	11½	11	10½
Lipu	8½	7	8

GIPN—S2—4 D. D. G. Obs—

Snowfall was reported to be above average in October and December and below it in November.

Mukteswar-Kumaun.—Reports for October and November were not received. There was only 1 light snowfall of 1″ depth in December, the snow extending to all the surrounding peaks of Nainital, Ramgarh etc. Snowfall was below the average of previous years.

IV.—ASSAM

Tawang.—(*Kameng Frontier Division*).—The depth of snowfall in different ranges of the district is given below:

Ranges	October	November	December
Mago	1′	1½′	1½′
Sela	1′	1½′	2′
Bumla	8″	1′	2′

In Tawang proper the depth was 1′ in December. Snowfall was normal during the period.

Siang Frontier Division.—Reports for October and November were not received. Snowfall was observed at the station and on the passes on 2 days in December. The depth of falls was 5″ at the station and varied from 3′ to 5′ on the passes. The surrounding peaks and ranges were covered with snow. The snowfall was normal.

Summary

Cold Weather Period, January and February.—Snowfall during the period was above normal in Jammu and Kashmir, Punjab (I) and in the Uttar Pradesh.

Hot Weather Period, March to May.—Snowfall was above normal in Jammu and Kashmir and in the Punjab (I) and normal in the Uttar Pradesh.

Monsoon Period, June and July.—Snowfall was normal in Jammu and Kashmir and in the Punjab (I) and below normal in the Uttar Pradesh.

Monsoon Period, June and July.—~~Snowfall was~~ falls during the period were as usual combined to higher altitudes. Snowfall was about normal in Jammu and Kashmir, Punjab (I) and the Uttar Pradesh.

Post-Monsoon Period, October to December.—Snowfall was about normal in Jammu and Kashmir and Assam and below normal in the Punjab (I) and the Uttar Pradesh.

N. B.—It is not possible to adopt a single classification of seasons which will be satisfactory for the whole of India. The classification adopted in this publication is, however, considered as the most satisfactory one and the least open to objection especially from the point of view of rainfall.